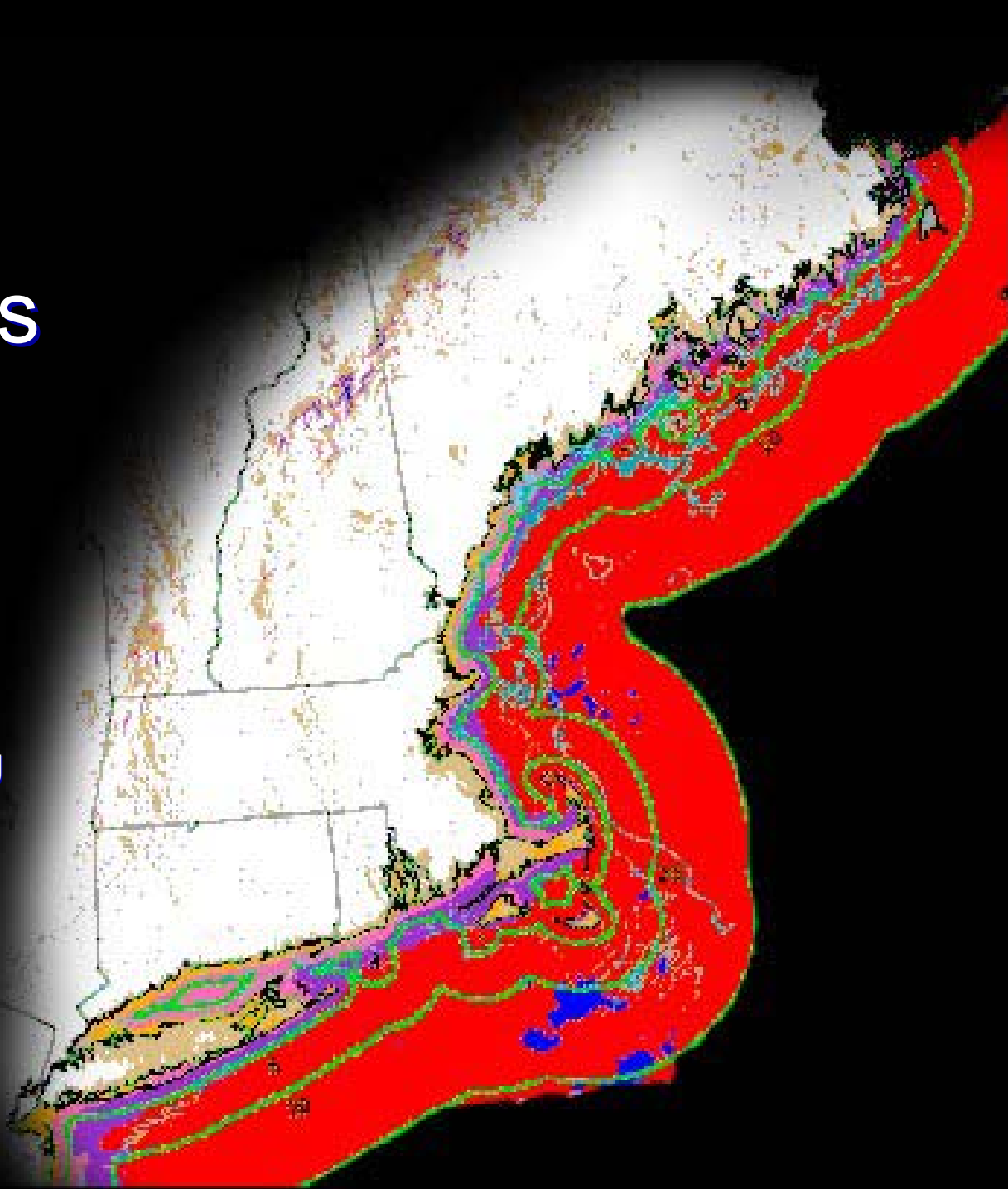


Offshore Wind Developments in the U.S.


Bonnie Ram
Energetics

FY2005 DOE Wind Program
R&D Implementation Meeting

Denver, Colorado
November 17, 2004



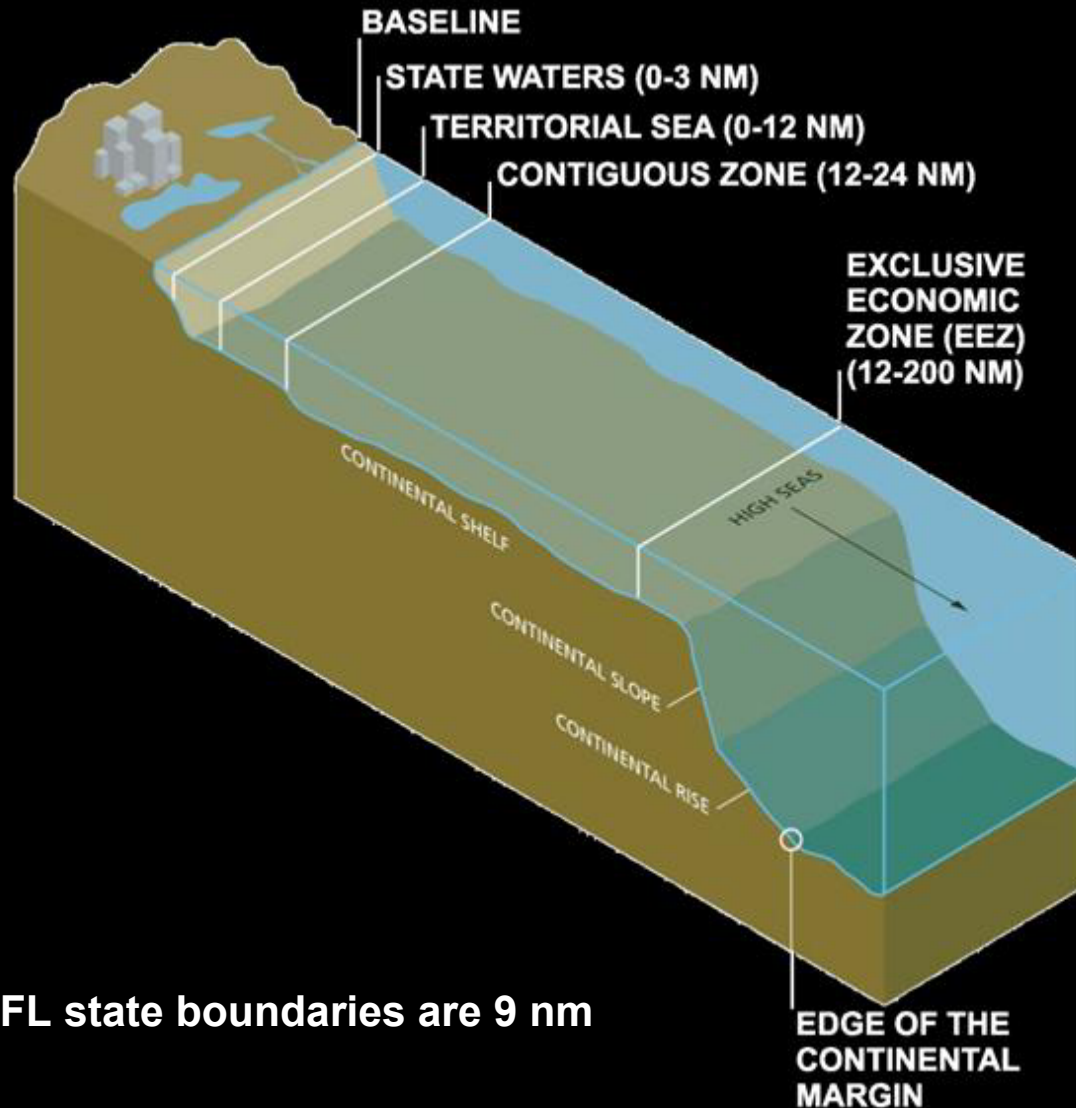
This Presentation

- ② Overview of NREL Research
 - ② Selected Federal Regulations
 - ② Current Projects
 - ② What are We Learning
 - ② Learning from the Europeans
 - ② Future Work
- 

NREL Research

- Assist NREL in supporting the Department of Energy Office of Wind and Hydropower Technologies
- Environmental policies and laws of offshore wind systems in the U.S. and Europe
- Review existing research and conduct a gap analysis
- Assist in organizing various technical workshops
- Tracking permit applications & state activities

Ocean Jurisdictions



TX & Gulf coast of FL state boundaries are 9 nm

Not to Scale

Potential Effects/Concerns

- Sea mammals
- Fisheries
- Avian
- Hydrography & Coastal effects
- Hard Bottom Substrate
- Viewshed
- Socioeconomics
- Community Acceptance
- Noise/Vibrations
- Radar Disturbances
- Landfall of Transmission Lines
- Subsea Cables/
Electromagnetic Fields
- Navigation & Risk collision
- Air Traffic Safety
- Marine Archaeology
- Cumulative Effects



Selected Federal Regulations

Legislative Authority	Major Program/Permit	Lead Agencies
Rivers And Harbors Act - Section 10	Prohibits the obstruction or alteration of navigable water of the U.S without a permit	U.S. Army Corps of Engineers (District Office)
National Environmental Policy Act (NEPA)	Requires submission of an environmental review for all major federal actions that may significantly affect the quality of the human environment	U.S. Army Corps of Engineers (District) Council on Environmental Quality
Coastal Zone Management Act	Consistency determination with the coastal program of the affected state	NOAA State Coastal Zone Management Agencies
Navigation and Navigable Waters	Navigation aid permit (markings and lighting)	U.S. Coast Guard
Navigational Hazard to Air Traffic	Determination of the safe use of airspace from construction start (lighting)	U.S Federal Aviation Administration (Regional Administrator)

Selected Federal Regulations

Legislative Authority	Major Program/Permit	Lead Agencies
Migratory Bird Treaty Act	No "taking" or harming of birds determination	Fish and Wildlife Service Migratory Bird Conservation Commission
National Historic Preservation Act	Consultation on the protection of historic resources — places, properties, shipwrecks	Department of the Interior State Historic Preservation Offices
Magnuson-Stevens Fishery Conservation & Management Act	Conserves & manages fish stocks to a 200-mile fishery conservation zone & designates essential fish habitat	National Marine Fisheries Service
National Marine Sanctuary Act (Title III)	Designates marine protected areas	National Ocean Service (NOAA)
Endangered Species Act	Consultation on action that may jeopardize threatened & endangered (listed) species or adversely modify critical habitat	Fish & Wildlife Service National Marine Fisheries Service

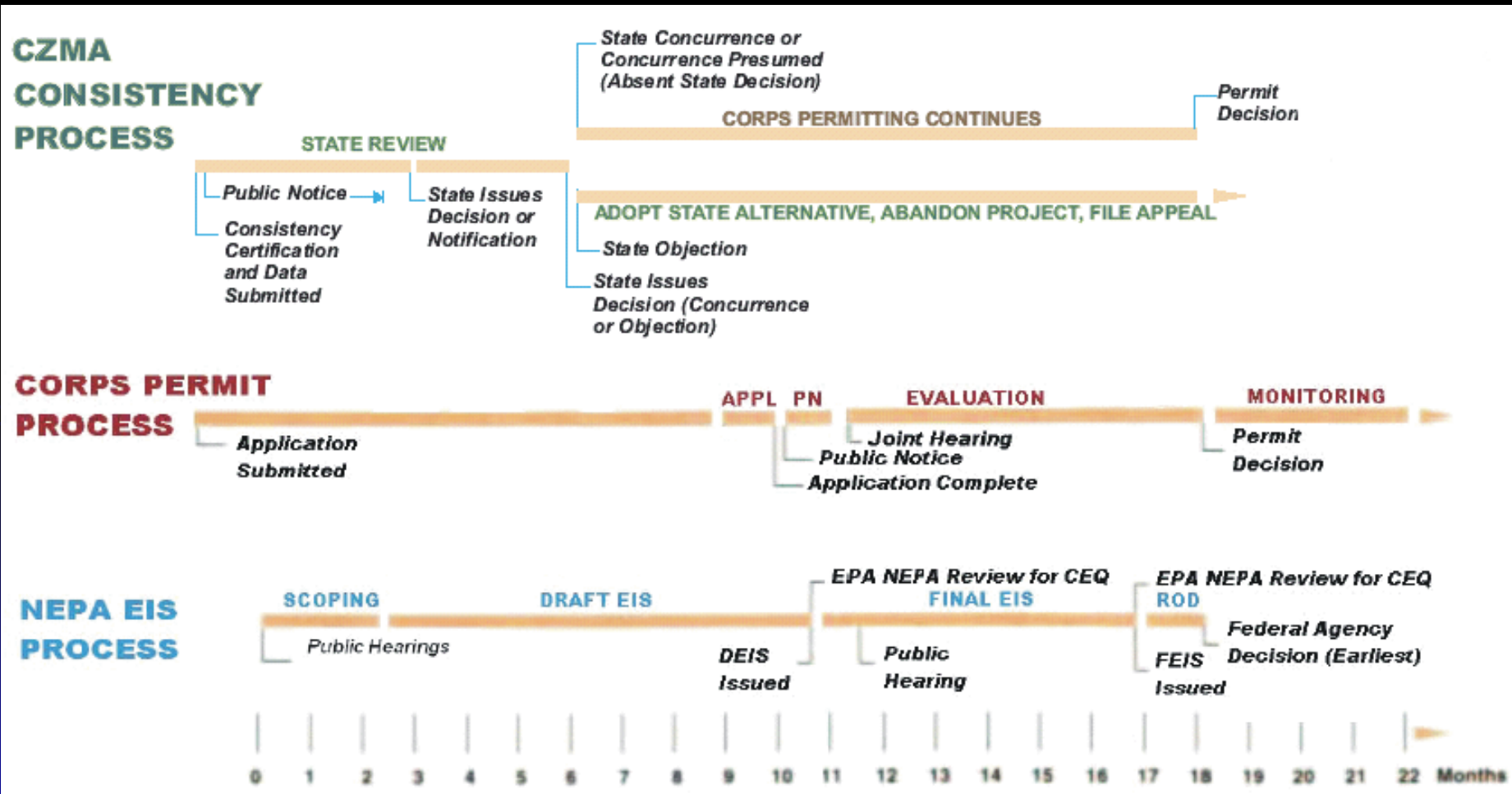
Selected Federal Regulations

Legislative Authority	Major Program/Permit	Lead Agency
Marine Mammal Protection Act	Prohibits or strictly limits the direct or indirect taking or harassment (Permits may be sought for "incidental take")	Fish & Wildlife National Marine Fisheries Service
Submerged Lands Act	Grants a lease for public lands held in trust by the government	Minerals Management Service
Outer Continental Shelf Lands Act	Manages the OCS with leasing rights for minerals production. Also covers artificial islands, installations, and other devices located on the seabed	Minerals Management Service
Clean Water Act	Regulates discharges of pollutants into the waters of the United States	U.S. Environmental Protection Agency
Estuary Protection Act	Conserves estuarine areas	Fish and Wildlife Service

Selected State and Local Authorities

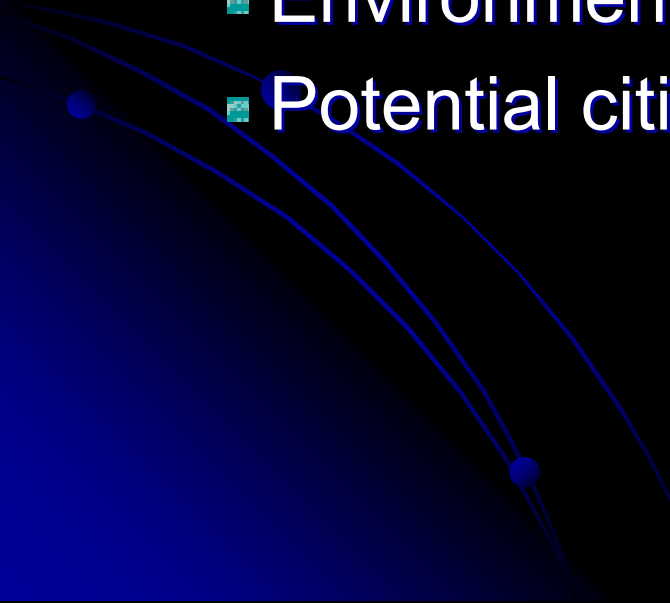
- Selected State Permits/Licenses/Approvals
 - Environmental Quality Review Boards
 - Coastal Zone Management Programs
 - Siting Boards for Energy Facilities and Transmission Lines
 - State Parks, Forests, and Cultural & Historic Resources
 - Tidal Wetlands, Coastal Erosion Hazard, Water Quality
- Local Land Use Entities
 - Town Planning Boards
 - Zoning Boards
 - By-laws (e.g., setbacks)

U.S. Army Corp of Engineers Permit and NEPA Process



Reference: Adapted from USACE presentation, Karen Adams

Community Involvement

- ④ Primary Objective of the Permit is Public Involvement & Public Interest Evaluation
 - Public hearings
 - Interagency cooperation
 - Environmental Impact Statement
 - Potential citizen lawsuits
- 

Status of U.S. Offshore Wind Projects

Applicant	Project Location	Application Filed	Status
Cape Wind	Nantucket Sound	November 2001	Draft EIS expected this year
Bald Eagle Power	Long Island Sound	May 2002	The applicant is revising the application
Greenlight	Lake Erie	May 2003	Project on hold
Winergy	Plum Island, NY	June 2003	Incomplete Application
Winergy	Smith Island, VA	July 2003	Application administratively withdrawn
Winergy	Asbury Park, NJ	NA	No meeting scheduled
Winergy	4 sites in New Jersey	NA	Pre-application meeting Nov 2002
Winergy	Indian River, Delaware	NA	Pre-application meeting Feb 2003
Florida Power and Light	Long Island Sound	TBD	Utility awarded the competitive project

Cape Wind

Nantucket Sound

- 468 MW = 130 3.6 MW GE turbines
- About 24 square miles
- Permit and environmental impact statement (EIS) process in third year
- Lacks political support
- Two lawsuits
 - Ten Taxpayers Citizen Group vs. Cape Wind Associates (8/03)
 - Alliance vs. US Army Corp of Engineers (9/03)

<http://www.capewind.org/>



**179 feet installed at
Horseshoe Shoal**

Cape Wind Project Status

© Federal Jurisdiction

- ENF/USACOE application filed – fall 2001
- Draft EIS – released November 2004

© State Jurisdiction

- Energy Facility Siting Board filing – fall 2002
- Tentative decision approving the project released July 1, 2004

Cape Wind View Simulations



An impact study commissioned by the developer of what the wind farm in Nantucket Sound would look like about 7 miles from Craigville Beach.

Optimistic Project Schedule

- ⦿ Final EIS – spring 2005
- ⦿ Project financial closing – mid 2005
- ⦿ Delivery of major components:
 - Monopiles – spring 2006
 - Electric Service Platform – mid 2006
 - WTGs – mid 2006
- ⦿ Complete project – mid 2007

Long Island Power Authority

Long Island Sound

- Ⓢ LIPA - a municipal utility
 - Guaranteeing purchase power agreement
- Ⓢ Early public involvement process
- Ⓢ Strong state political support
- Ⓢ LIPA selected FPL Energy - May 2004

<http://lioffshorewindenergy.org/>

Long Island Project

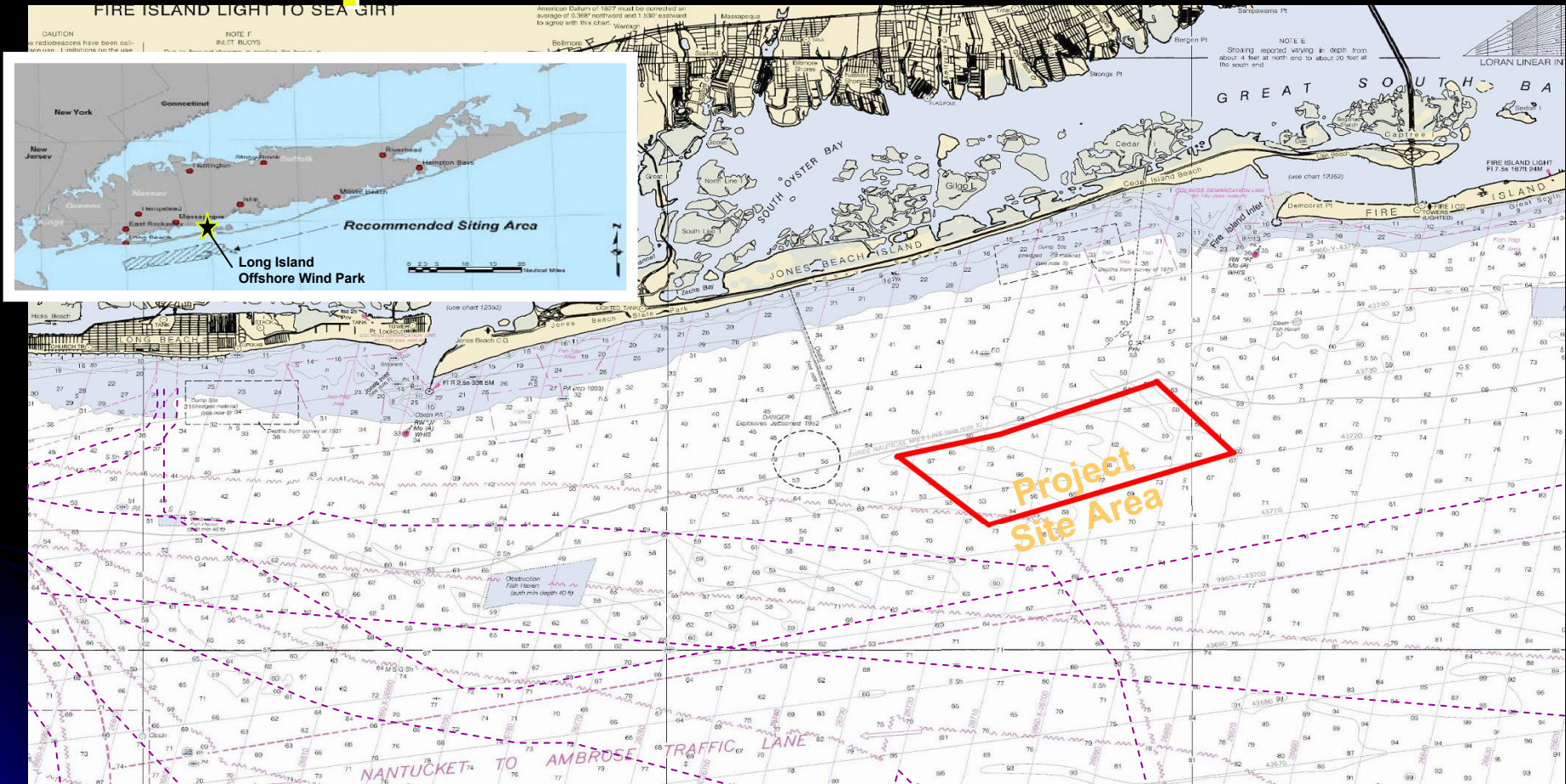
- 140 MW
- 30 to 50 3-5 MW wind turbines
- 138 kilovolt offshore substation
- Commercial operations by 2008
- LIPA-owned interconnect



The map displays the Long Island Sound region, bordered by New York to the north and east, Connecticut to the northeast, and New Jersey to the west. Key locations marked on Long Island include New Rochelle, Yonkers, Westchester, Putnam, Rockland, Orange, Dutchess, Sullivan, Ulster, and Albany. Specific sites along the coast are indicated by red dots and labeled: Westchester, Rockland, Putnam, Orange, Dutchess, Sullivan, Ulster, Albany, New Rochelle, Yonkers, Westchester, Putnam, Rockland, Orange, Dutchess, Sullivan, Ulster, Albany. A shaded area in the Sound is labeled 'Recommended Siting Area' with an arrow. A scale bar and north arrow are also present.



Proposed Wind Park Location



- Wind project area is approximately 7.5 square miles
- Average water depth is about 61 feet

LIPA View Simulations



7.5 miles from shore

LIPA View Simulations

3 miles off
Jones Beach



No National Program = Uncertainties

- No national energy strategy
 - Delays w/ inconsistent policies
 - Coastal states taking the lead
- Muddled institutional & legal boundaries
 - Jurisdictional control may shift
 - No clear legal authority within the outer continental shelf
 - Multiple agencies with different jurisdictions



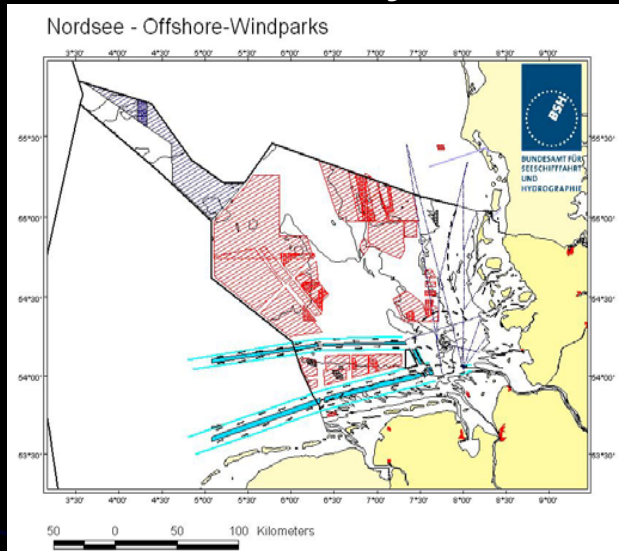
Learning from the Europeans?

- A national energy policy works
 - Political will
 - Financial incentives
 - Lawsuits not common
- Climate change motivated the offshore wind policy!



Europeans are Planning on a National Scale

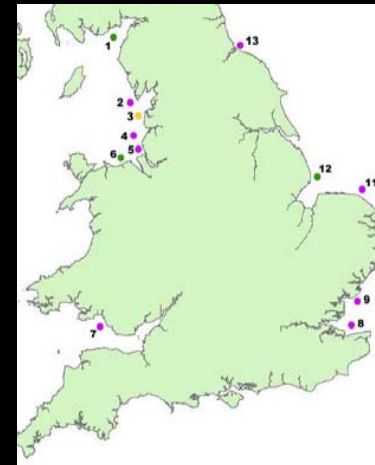
Germany



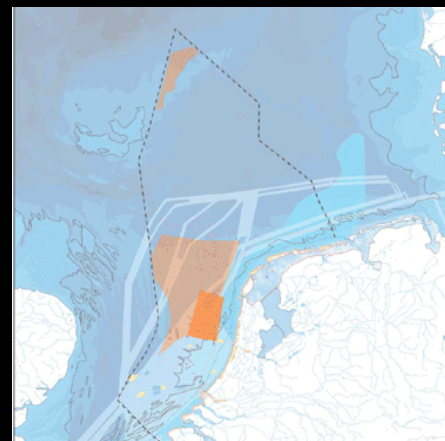
Denmark



Great Britain



Belgium



Netherlands

Learning From the Europeans

- Public funds & demonstration projects were critical to current deployment
 - Multi-million \$\$ environmental research programs
 - Speeds up baseline research & permitting
- No significant environmental effects identified YET from Europe
 - Before-After-Control-Impact methodologies
 - Study design and results need peer review
 - Preliminary conclusions across sites emerging

Future DOE/NREL Activities

- ② Track US projects & state activities
 - Workshops - Tutorial in New York
- ② Co-lead the IEA offshore wind annex
- ② Learning from European environmental studies
- ② Seek out partnerships
 - Anticipate jurisdictional shift to Minerals Management Service
 - Massachusetts Technology Collaborative
- ② Level the playing field

THANK YOU

